The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BYEONG-DAE CHOI

Appeal 2007-0037
Application 10/032,056[1]
Technology Center 2800

Decided: March 27, 2007

Before JAMES D. THOMAS, LEE E. BARRETT, and
JOSEPH F. RUGGIERO, *Administrative Patent Judges.*

BARRETT, *Administrative Patent Judge.*

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the Final Rejection of claims 1-14. Claim 15 has been canceled. Claims 16-19 are withdrawn pursuant to a restriction requirement.

We affirm.

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[1] Application filed December 31, 2001, entitled "Array Substrate for a Liquid Crystal Display Device and Method of Manufacturing the Same," which claims the foreign filing priority benefit of Republic of Korea Application 2001-2971, filed January 18, 2001.

BACKGROUND

The claims are directed to a liquid crystal display device wherein the entire surface of the data lines, which are made from a transparent conductive material such as indium tin oxide (ITO), are covered with an additional metal of low resistance such as aluminum.

Claim 1 is illustrative:

1. An array substrate for a liquid crystal display device, comprising:

a substrate;

a plurality of gate lines arranged transversely on the substrate;

a plurality of data lines disposed orthogonal to the plurality of gate lines;

a plurality of thin film transistors formed on the substrate adjacent to intersections of the gate lines and the data lines, each thin film transistor including a gate electrode, a gate insulation layer, an active layer, an ohmic contact layer, a source electrode, and a drain electrode;

a plurality of pixel electrodes disposed at pixel regions defined by the intersections of the gate lines and the data lines, each pixel electrode connected to a corresponding one of the drain electrodes; and

a metal layer formed on an entire surface of each of the data lines and at peripheral portions of the drain electrode,

wherein the drain electrode and the pixel electrode are formed from the same material.

THE REFERENCES

The Examiner relies on the admitted prior art (APA) in Appellant's Figures 2 and 3F and the following prior art reference:

Kakuda	5,162,933	Nov. 10, 1992

THE REJECTION

Claims 1-14 stand rejected under 35 U.S.C § 103(a) as unpatentable over the APA and Kakuda. The Examiner found that the APA teaches the claimed subject matter except for the limitation of "a metal layer formed on an entire surface of each of the data lines." The Examiner found that Kakuda discloses a liquid crystal display (LCD) device having a data line 11a with a metal layer 11b formed on the entire surface and finds that "[w]ith such a configuration, the materials of the data line provide a light blocking function, have good heat resistance, may lower the electrical resistance, and help simplify the manufacturing process because the data line can be formed simultaneously with the pixel electrode (col. 6, line 61 - col. 7, line 29)" (Final Rejection 3). The Examiner concluded that it would have been obvious "to modify the data line of the APAF by forming a metal layer on the entire data line as taught by Kakuda to provide a light blocking data line having good heat resistance, a specified electrical resistance, and [] reduced manufacturing steps" (Final Rejection 3). In response to the arguments, the Examiner found that column 7, lines 44-67, of "Kakuda discloses the known practice of forming laminated matrix lines of ITO and

metal in an active matrix LCD device to reduce the resistance of the lines" (Final Rejection 4).

DISCUSSION

Appellant does not separately argue the patentability of the dependent claims. Accordingly, the claims stand or fall together with the rejection of independent claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Appellant does not contest that the only difference between the subject matter of claim 1 and the APA is that the APA does not disclose "a metal layer formed on an entire surface of each of the data lines."

The issue is whether Kakuda provides teaching, suggestion, or motivation for one of ordinary skill in the art to modify the APA to provide "a metal layer formed on an entire surface of each of the data lines."

Kakuda teaches that "*in an active matrix LCD (liquid crystal display), it is desirable, for the purpose of reducing the resistance of matrix lines, to employ a laminated structure in which an aluminum film overlies the ITO film forming the transparent electrode*, but direct lamination of the ITO and aluminum (Al) films poses a problem as the ITO is corroded by preferential dissolution resulting from galvanic action between the dissimilar metals" (emphasis added) (col. 7, ll. 51-59). Thus, Kakuda teaches that it is desirable to provide a metal layer over the entire surface of the data lines to reduce the resistance which is an express teaching/suggestion/motivation for one of ordinary skill in the art to modify the APA to provide such a metal layer. Moreover, this is the same reason that Appellant uses the metal layer

over the ITO layer (*see* Specification, ¶ 0019 and ¶ 0045). The Examiner points to the relevant teaching of Kakuda in response to Appellant's arguments at Final Rejection 4. The combination of the APA and Kakuda establishes a prima facie case of obviousness.

Appellant argues that Kakuda is completely silent with regard to teaching that covering the ITO layer 11a with a metal layer 11b results in providing "a light blocking data line having good heat resistance, a specified electrical resistance, and [] reduced manufacturing steps" as stated by the Examiner (Br. 4). It is argued that column 6, line 61, through column 7, line 29, cited by the Examiner, is unrelated to covering the ITO layer 11a with a metal layer 11b (Br. 4-5; Br. 7-8). It is argued that Kakuda fails to teach or suggest "the materials of the data line provide a light blocking function, have good heat resistance, may lower the electrical resistance, and help simplify the manufacturing process because the data line can be formed simultaneously with the pixel electrode" as stated by the Examiner (Br. 4). Appellant argues that Kakuda's invention relates to the benefits of the light blocking layer and storage capacitance electrode and the Examiner's alleged motivation, i.e., "the materials of the data line provide a light blocking function, have good heat resistance, may lower the electrical resistance," is not directed toward any structure associated with the data line 11 (Br. 5-6). Appellant's Brief and Reply Brief largely deal with the failure of the Examiner's reasoning to establish proper motivation.

We generally agree with Appellant that the Examiner's statement of motivation is not persuasive. Kakuda is concerned with the benefits of the light blocking layer to shield the thin film transistor and a storage capacitance electrode. Adding a metal layer to the data line has nothing to do with a light blocking function (which the Examiner appears to concede at Answer 4, ll. 6-7). Nor does adding a metal layer having anything to do with simplifying the manufacturing process: the manufacturing process is simplified by making the ITO data line 11a and the ITO pixel electrode 11 at the same time, which has nothing to do with the metal layer 11b.

Nevertheless, the Examiner pointed to column 7, lines 44-67, in the Final Rejection and states in the Examiner's Answer that "Kakuda then goes on to disclose (col. 7, lines 51-55) that '. . . in an active matrix LCD (liquid crystal display), it is desirable, for the purpose of reducing the resistance of matrix lines, to employ a laminated structure in which an aluminum film overlies the ITO film forming the transparent electrode . . .'" (Answer 6-7) and that "Kakuda specifically teaches that the LCD device has a data line11a with a metal layer (molybdenum-base alloy) 11b formed on the entire surface (col. 4, lines 45-49)" (Answer 7). Thus, the Examiner has pointed to the relevant motivation in Kakuda to modify the APA.

Appellant recognizes the Examiner's reliance on column 7, lines 44-67, of Kakuda for the known practice of forming laminated matrix lines of ITO and metal in an active matrix LCD device to reduce the resistance of lines, but argues that it "is completely taken out of context with

regard to the entire disclosure of Kakuda et al." (Br. 9). It is argued that Kakuda discloses the different failures associated with using aluminum, and thus actually discloses disadvantages of using the known practice of forming laminated conductive lines in LCD devices, and does not rebut Appellant's argument that Kakuda does not provide motivation to modify the APA (Br. 9) and teaches away from using laminated structures (Reply Br. 4).

Kakuda expressly teaches the desirability of providing an aluminum layer over the entire surface of the data lines to reduce the resistance and, so, teaches doing exactly what Appellant has done. The fact that Kakuda discloses that there may be corrosion problems with an aluminum layer does not teach that aluminum will not work. A reference "teaches away" when it states that something cannot be done. *See In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131-32 (Fed. Cir. 1994). Here, Kakuda only discloses that there are problems, not that it will not work. Appellant discloses using an aluminum layer without disclosing any problems (*see* Specification ¶ 0044). The fact that Kakuda recognizes the problem does not remove it as a reference for all that it teaches one of ordinary skill in the art.

It is argued that "Kakuda et al. is completely silent with regard to providing any motivation, either implicitly or explicitly, with which to modify the data line structure shown in Appellant's Related Art FIGs. 1-3 in order to arrive at Appellant's claimed invention" (Br. 6-7).

We disagree for the reasons stated above. Kakuda expressly discloses motivation for the proposed modification.

In conclusion, the combination of the APA and Kakuda establish a prima facie case of obviousness which has not been shown to be in error. The rejection of claims 1-14 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

KIS

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